Claims

1. Method for the operation of a battery sensor (1), comprising an ammeter to determine the current in the battery, an evaluation unit (3) and a microprocessor (4), wherein,
during an idle phase (RP), in which main electrical consumers (8, 10, 12) that are assigned to a battery (2) are switched off,
- the microprocessor (4) is directed into a switched-off state,
- at given first time intervals (TA1), the test signal from the ammeter for a given first time duration (TD1) is determined by the evaluation unit (3) and first current values (I_W1) are assigned thereto, the values being monitored in the evaluation unit to check whether a first threshold current (I_THD1) has been exceeded and/or whether a second threshold current (I_THD2) has been undershot,
- when the threshold current values (I_THD1, I_THD2) have been exceeded or undershot, the microprocessor (4) is moved into a switched-on state and for a given second time duration (TD2), the test signal from the ammeter is determined by the evaluation unit (3) and second current values (I_W2) are assigned thereto, the values then being evaluated in the microprocessor (4),
- given procedures for maintaining the electric charge in the battery (2) are initiated by the microprocessor (4) if a given condition is met, said condition depending on the second current values (I_W2) and
- the first time duration (TD1) being shorter than the second time duration (TD2).

2. Method according to claim 1, wherein

during the idle phase (RP), the microprocessor (4) is moved into the switched-on state in given second time intervals (TA2) and for the second given time duration (TD2), the test signal from the ammeter is determined in the evaluation unit (3) and second current values (I_W2) are assigned thereto, the values then being evaluated in the microprocessor (4), the second time intervals (TA2) being greater than the first time intervals (TA1).

3. Method according to any of the preceding claims, wherein an integral for the current over the time duration of the idle phase (RP) is determined as a function of the respective second current values (I_W2).

4. Method according to claim 1,wherein
a wake-up signal (S_WU) is generated for a superordinate control unit (6), which is able to implement procedures to maintain the charge in the battery (2) if the integral for the current exceeds a given integral threshold (I_I_THD).

5. Method according to any of the preceding claims, wherein the battery sensor (1) comprises a voltage divider which, on the input side, is supplied with the voltage discharged on the battery (2), and on the output side, is conductively connected to an input (20) on the evaluation unit (3), a first switch (18) being arranged electrically in series with the voltage divider. In one switch position, the aforementioned switch shuts off the flow of current through the voltage divider and, in another switch position, it enables the flow of current through the voltage divider, the first switch (18) being directed during the idle phase (RP) into the switch position in which it shuts off the flow of current through the voltage divider.

6. Method according to claim 5, wherein
a low power resistor is arranged electrically in parallel with the voltage divider, electrically in series to which a second switch (30) is arranged, which in one switch position shuts off a flow of current through the low power resistor and, in another switch position, enables the flow of current through the low power resistor, wherein
- the second switch (30) is directed into the switch position in which it shuts off the flow of current through the voltage divider and the voltage on the output side of the voltage divider is determined as the first voltage value (U_W1),
- the second switch (30) is directed into the switch position in which it enables the flow of current through the voltage divider and the voltage on the output side of the voltage divider is determined as a second voltage value (U_W2) and
- as a function of the first and the second voltage values, a line resistance (R_L) of an electrically conductive connection is determined between the battery and the voltage divider.

7. Method according to any of the preceding claims, wherein the battery comprises at least a first and a second battery (2a, 2b), which are electrically arranged in series and the battery sensor has a voltmeter, the measuring signal of which is characteristic of the voltage discharged either on the first or the second battery, measurement values on the voltmeter being determined at given third time intervals (TA3) and measurement values for the output voltage of the voltage divider being determined at given fourth time intervals (TA4). The third

time intervals (TA3) are greater than the fourth time intervals (TA4).

8. Method according to any of the preceding claims, wherein a generator (34) is assigned to the battery (2) electrically in parallel therewith and a further voltmeter is provided in the battery sensor (1), the measuring signal of which is characteristic of the voltage discharged on the generator (34), measured values from the further voltmeter being determined at given fifth time intervals (TA5) and measured values for the output voltage of the voltage divider being determined at given fourth time intervals (TA4). The fifth time intervals (TA5) are greater than the fourth time intervals (TA4).

9. Method according to any of the preceding claims, wherein when the voltage drops below a given threshold voltage (U_THD), given operating parameters of the battery (2) are determined and stored in a non-volatile manner.

10. Battery sensor, comprising an ammeter to determine the current in the battery, an evaluation unit (3) and a microprocessor (4) and which is designed so that, during an idle phase (RP) in which main electrical consumers (8, 10, 12) assigned to a battery (2) are switched off,
- the microprocessor (4) is directed into a switched-off state,
- at given first time intervals (TA1), the test signal from the ammeter for a given first time duration (TD1) is determined by the evaluation unit (3) and first current values (I_W1) are assigned thereto, the values being monitored in the evaluation unit to check whether a first threshold current value (I_THD1) has been exceeded and/or whether the current

has dropped below a second threshold current value (I_THD2),

- when the current has exceeded or dropped below the threshold current values (I_THD1, I_THD2), the microprocessor (4) is moved into a switched-on state and for a given second time duration (TD2), the test signal from the ammeter is determined by the evaluation unit (3) and second current values (I_W2) are assigned thereto, the values then being evaluated in the microprocessor (4),
- given procedures for maintaining the electric charge in the battery (2) are initiated by the microprocessor (4) if a given condition is met, said condition depending on the second current values (I_W2) and
- the first time duration being shorter than the second time duration (TD2).

11. Battery sensor according to claim 10, comprising a voltage divider which, on the input side, is supplied with the voltage discharged on the battery (2), and on the output side, is conductively connected to an input (20) on the evaluation unit (3), a first switch (18) being arranged electrically in series with the voltage divider. In one switch position, the aforementioned switch shuts off the flow of current through the voltage divider and in another switch position it enables the flow of current through the voltage divider.

12. Battery sensor according to claim 11, wherein a low power resistor is arranged electrically in parallel with the voltage divider, electrically in series to which a second switch (30) is arranged, which in one switch position, shuts off a flow of current through the low

power resistor and, in another switch position, enables the flow of current through the low power resistor.

13. Battery sensor according to any of the preceding claims, wherein
the battery (2) comprises at least a first and a second battery (2a, 2b), which are electrically arranged in series and a voltmeter (40) to determine the voltage discharged either on the first or second battery (2a, 2b).

14. Battery sensor according to any of the preceding claims, wherein
a generator (34) is assigned to the battery electrically in parallel therewith and a further voltmeter (36) is provided to determine the voltage discharged on the generator (34).